

## What is Claimed is:

1. An isolated and purified polynucleotide comprising Sequence ID No. 6
2. The isolated and purified polynucleotide of claim 1, where said polynucleotide is a  
5 cyanobacterial nucleic acid fragments encoding a herbicide resistant AHAS large subunit gene.
3. A nucleic acid fragment of claim 1 where the said cyanobacteria is *Synechocystis* PCC 6803.
4. An isolated and purified polynucleotide comprising Sequence ID No. 17
- 10 5. The isolated and purified polynucleotide of claim 4, where said polynucleotide is a cyanobacterial nucleic acid fragments encoding a herbicide resistant AHAS small subunit gene.
6. A nucleic acid fragment of claim 4 where the said cyanobacteria is *Synechocystis* PCC 6803.
- 15 7. A method for target site gene identification in cyanobacteria, said method, the successful development of various protocols for High-Through-Put molecular manipulation of *Synechocystis*, comprising
  - (1) lead compound identification,
  - (2) generation and selection of resistant mutant,
  - 20 (3) Isolation of genomic DNA from resistant cell lines.
  - (4) Primer design and PCR amplification of gene fragments from *Synechocystis*
  - (5) High Through Put genetic transformation and target site gene identification
8. An isolated and purified polynucleotide comprising Sequence ID No. 3
9. The isolated and purified polynucleotide of claim 8, where said polynucleotide is a  
25 cyanobacterial nucleic acid fragments encoding a herbicide resistant mutant pds gene.

10. A nucleic acid fragment of claim 1 where the said cyanobacteria is *Synechocystis* PCC 6803.